

disease. It was found, however, that although there was amelioration in the condition of the patient in the early stages of the treatment, the drug soon lost its effect, whilst certain sequelæ, e.g. blindness, the results of the action of the drug, led men to be exceedingly chary of using it. In connection with sleeping sickness, Koch, following up Bruce's theory of a living reservoir in which certain parasites might exist without giving rise to any definite and appreciable disease, instancing the wild buffalo, where the parasite is kept alive in its host without apparently doing any damage, but ready to attack non-immunised animals when carried to them by the tsetse fly (*Glossina morsitans*), Koch suggested that the crocodile might be the reservoir host of the trypanosome that gives rise, when carried to the human being by another tsetse fly (*Glossina palpalis*), to sleeping sickness, and he then made the suggestion, afterwards carried out, that the infective zone around certain waters should be cleared of its underwood, and the crocodiles lurking there and in the neighbouring waters killed. Koch also worked at malaria in Java and in the Malay Peninsula. He studied black-water fever and tried to determine its relation to malaria, or, alternatively, to quinine poisoning contracted during the treatment of malaria.

Koch's last great public appearance was at the Washington Congress on Tuberculosis in 1908, when he announced that he intended to devote the remaining years of his life to the settling of the question that he had raised in London eight years earlier, and everyone hoped that he had some years of useful work before him. These years have been all too few, and we cannot expect that the work he then undertook is finished.

The record of a man's work is his best obituary notice—and in such a case as that now under consideration the writer is relieved of an enormous responsibility—but this notice would be very incomplete did it not contain some record of the honours accorded to him by his fellows, especially those who followed and appreciated his work. Robert Koch was an honorary member of a very large number of learned associations, amongst them of the Prussian Academy and of the Royal Society of London. He had been invested with the Prussian and French Orders of Merit, and with orders of various kinds awarded by the rulers of almost every State in Europe. In some cases these distinctions might mean but little to those who come after us, but, associated with Koch's name, they must ever retain their significance as associated with one of the names on the imperishable roll of the great in science. The death of Robert Koch involves a loss not to Germany only—all mankind is the poorer.

#### MAJOR PHILIP CARDEW, R.E.

MAJOR PHILIP CARDEW, whose death we record with deep regret, combined a fine mathematical mind with careful scientific training, and a remarkable natural ability in grasping the principles involved in any practical question. He passed through Woolwich Academy with every honour, and started a brilliant career in the Royal Engineers in 1871. He was appointed, in 1883, instructor in electricity at the Military School of Engineering at Chatham, and threw himself with great energy into those innumerable electrical problems which were being so rapidly developed in telegraphy, telephony, electric lighting and power. In 1888 he was selected as the first electrical adviser to the Board of Trade, and he inaugurated the rules and regulations for the use of electricity for public supply and for electric tramways and railways. These rules have formed a model for

all countries, and there is very little doubt that the freedom of water and gas pipes in England from electrolysis due to stray tramway currents is the result of the wise restrictions which Major Cardew initiated. The standardisation of electrical units was part of his work.

When Major Cardew retired from the Board of Trade his energies were diverted into the execution of various lighting, power, and traction schemes. Under his personal guidance, every Government dockyard in the British Empire has been equipped with electric power, and numerous electric railways, tramways, and lighting systems originated. He was a prolific inventor, and his vibrator is largely in use in connection with military telegraphs, while the hot-wire voltmeter which bears his name was for years one of the few trustworthy electrical instruments. The Cardew safety earthing device has also been of great value in connection with the public supply of electricity.

Major Cardew contributed a number of papers on electrical subjects to the Royal Society and the Institution of Electrical Engineers.

His death, at the early age of fifty-eight, is greatly to be regretted. He was intimately associated with all the modern developments of electricity, and his experience and advice were much in demand.

#### NOTES.

IN consequence of the death of King Edward VII., the usual ladies' conversazione of the Royal Society will not be held this year.

At a meeting of the council of the Royal Society, held on Thursday, May 26, at Burlington House, an address of condolence and homage to His Majesty King George V. was adopted, and the society's seal affixed. At the ordinary meeting of the society, which followed, the address was communicated to the fellows present by the president, Sir Archibald Geikie, who spoke as follows:—"Since the last meeting of the society a great calamity has unexpectedly befallen the country, and under the shadow of that mournful event we now resume our duties. The death of King Edward is a national loss, the full effect and meaning of which cannot yet be appreciated. We, fellows of the Royal Society, share in the universal sorrow that a life so revered, so full of achievement, and with the promise of still many fruitful years, should have been cut short in its prime. But we have also a more personal ground for regret. The late King had been for nearly half a century one of our fellows, and on his accession to the throne had become our patron. Among the many claims which His Majesty had to our regard, not the least was the interest which he always took in the furtherance of that natural knowledge which the Royal Society was founded by Charles II. to promote. In our annals the name of King Edward VII. will always hold an honoured place. The council has approved and sealed an address to His Majesty King George V. in which, while expressing our condolence in the deep grief of the Royal Family, we offer our respectful congratulations on his accession to the throne of his ancestors, and our confident hope that his reign may be long and prosperous." The address was then read from the chair, and was adopted in silence, the fellows present all standing.

As we go to press, the *Terra Nova* is starting on her journey with the British Antarctic Expedition, and, after calling at a number of places, is expected to arrive at Lyttelton, New Zealand, about October 13. Hitherto Antarctic expeditions have sailed to the south in the latter

part of December, but with the *Terra Nova* it is hoped to penetrate the pack ice at an earlier date than it has been possible for previous expeditions to do, and accordingly the ship will leave New Zealand towards the end of November, and probably reach McMurdo Sound about the end of December. On arrival in McMurdo Sound the western party will be landed, and as soon as the winter station has been established the greater number of the party will proceed to the south to lay depôts. It may be possible to start this party off not later than the third week in January. At the same time, the ship will leave McMurdo Sound and proceed to the eastward to explore King Edward's Land. A small eastern party will probably be left with full supplies and some transport facilities. After landing the eastern party the ship will return to McMurdo Sound, and then proceed to the northward. At the latest this will probably be in the third week of February. If there is coal enough the *Terra Nova* will be directed to investigate the pack in the region of the Balleny Islands, and to proceed to the westward or to the south of these islands. These objects will occupy the ship during the month of March, after which she will be directed to return to New Zealand. The western party, it is hoped, will by the month of April be safely established in the hut, with suitable depôts laid well south of the barrier. During the winter, preparations will be made for an effort to reach the South Pole in the following season. Captain Scott states that he does not propose to start upon the southern journey until the month of October. That month and the following will be spent traversing the Barrier and ascending the glacier. He hopes to reach the upper plateau fairly early in December, and an ideal day for reaching the South Pole would be December 22. Captain Scott will be accompanied by, among others, Lieut. E. R. G. R. Evans, R.N., second in command; Dr. E. A. Wilson, chief of scientific staff; Lieut. H. L. L. Pennell, R.N., magnetic and meteorological work in *Terra Nova*; Surgeon G. M. Levick, R.N., doctor and zoologist; Surgeon E. L. Atkinson, R.N., doctor, bacteriologist, parasitologist; Dr. G. L. Simpson, physicist; Mr. T. Griffith Taylor, geologist; Mr. E. W. Nelson, biologist; Mr. D. G. Lillie, biologist; Mr. W. G. Thompson, geologist; and Mr. C. S. Wright, chemist.

SIR DAVID GILL, K.C.B., F.R.S., has been appointed a Knight of the Prussian Order of Merit. The honour was conferred on Tuesday through the German Ambassador in London, by order of the German Emperor.

DR. W. THOMAS, assistant lecturer in the Liverpool School of Tropical Medicine, has been appointed director of the new laboratories at Manaos, in the State of Amazonas.

THE death is announced, in his sixty-third year, of Prof. W. Rose, emeritus professor of surgery at King's College, London, and author of a number of works on various surgical subjects, including the standard text-book "A Manual of Surgery," of which he was joint author with Mr. A. Carless.

THE Harben lectures will be delivered by Sir W. B. Leishman, F.R.S., professor of pathology in the Royal Army Medical College, London, in the Royal Institute of Public Health, on June 8, 15, and 22, the subject being "Anti-typhoid Inoculation."

THE *Pourquoi Pas?* having on board Dr. Charcot and other members of his expedition to south polar regions, arrived at Guernsey on Tuesday. Dr. Charcot expressed

satisfaction with the journey, and said that he had accomplished all that he had expected, and had brought back valuable scientific results, including a large collection of animal remains. Among the geographical results is the charting of land south of the Adelaide Islands.

THE council of the Royal Society of Arts has elected the Hon. Theodore Roosevelt a life member of the society under the terms of the by-law which empowers it to elect annually not more than five persons who have distinguished themselves by the promotion of the society's objects. The first American member of the society was Benjamin Franklin, who was elected in 1755.

THE annual general meeting of the Research Defence Society will be held on Friday, June 3, at 5 o'clock, in the library of the Royal College of Physicians, Pall Mall East, S.W. The chair will be taken by the Earl of Cromer, president of the society. The other speakers will be Sir Richard Douglas Powell, Bart., K.C.V.O., Sir David Bruce, K.C.B., F.R.S., Mr. Anthony Hope Hawkins, and Mrs. Scharlieb.

THE *Times* Geneva correspondent reported that on May 26, at 7.12 a.m., a violent earthquake shock traversed the whole of Switzerland from north to south, touching Bâle, Zürich, Berne, and Geneva. Messages from Paris and Berlin showed that the shock was felt at Belfort, Mülhausen, Upper Alsace, and parts of Baden. At Freiburg the shock lasted for some seconds. During the previous evening violent thunderstorms visited some parts where the earthquake was recorded.

THE annual meeting of the Selborne Society will be held in the theatre of the Civil Service Commission, Burlington Gardens, on Friday, June 17. After business has been transacted an address will be delivered by Mr. J. Buckland on the traffic in feathers and the need for legislation. The Selborne Society, of which the late Lord Tennyson was, and Lord Avebury now is, president, has recently been developing its work and increasing its activities. During last year it acquired new offices at 42 Bloomsbury Square, in order to form a home for its library and to provide reading and committee rooms.

THE council of the Institute of Metals has appointed a committee to investigate the causes of the corrosion of non-ferrous metals by sea-water, acids, &c., and by other chemical and electrolytic reactions. The members of the committee are:—Sir Gerard Muntz, Bart. (chairman), Prof. H. C. H. Carpenter (secretary), Captain G. G. Goodwin, R.N., Prof. A. K. Huntington, Mr. J. T. Milton, Mr. A. Philip, Mr. L. Sumner, Prof. T. Turner, and Sir William H. White, K.C.B., F.R.S. The committee has decided, in the first instance, to confine its attention to the question of the corrosion of condenser tubes in marine engines and in stationary engines using foul water, or being subject to violent electrolytic action, such as often occur in electric power stations.

MANY members of the British Association will learn with regret of the death of Mr. Alfred Colson, who was chairman of the executive committee and local honorary secretary for the meeting of the association at Leicester in 1907. Mr. Colson was a past-president of the Institution of Gas Engineers, and also of the Leicester Literary and Philosophical Society. His work as the gas and electric light engineer of the Leicester Corporation will remain a permanent memorial to his adaptability and technical knowledge, and his great organising powers will be remembered by all who were present at the Leicester meeting of the British Association.



THE Board of Education has been informed through the Foreign Office that the second session of the seventeenth International Congress of Americanists will be held at Mexico City on September 8-14. The sessions will be held in the lecture hall of the National Museum in Mexico City. An organising committee has been formed, the president of which is Sr. Lic. D. Justo Sierra, Secretary of Public Instruction and Fine Arts for the Government of Mexico. Communications to the congress, which may be either oral or written, may be made in English, French, German, Italian, Portuguese, or Spanish. The congress will deal with questions relating to the ethnology, archaeology, and history of the New World. For further information application should be made to the general secretary of the organising committee, Sr. Lic. D. Genaro Garcia, Museo Nacional, Mexico, D.F.

WE regret to see the announcement that Prof. Emil Zuckerkandl died on May 28, in his sixty-first year, at Vienna, where he had occupied the chair of anatomy for nearly thirty years. He was well known to anatomists for his many and varied contributions to human and mammalian morphology. He was trained under Hyrtl and Carl Langer, and acted as prosector in the University of Vienna until he was called to fill the chair of anatomy at Graz in 1887. His best known work, on the anatomy and diseases of the nasal cavities (1882-92), is one which will remain an authoritative memoir for many years to come. His numerous monographs on the arterial system and on the morphology of the brain, especially of the ape and marsupial, are based on elaborate and patient observation, but somewhat prolix, and unrelieved by wide and happy generalisations. It is rather his contributions to the more medical and practical side of human anatomy that will prove of permanent value. He was successful in maintaining the world-wide reputation which Hyrtl and Langer and other previous occupants of his chair had won for the Anatomical School of Vienna.

MR. MICHAEL CARTEIGHE, whose death occurred at Goring-on-Thames on May 30, was for fourteen years president of the Pharmaceutical Society of Great Britain. He received his pharmaceutical education at the School of Pharmacy, and also studied at University College, London, where he became demonstrator in chemistry under Prof. Williamson. While at University College he took part in some important chemical and physical researches, one of the most notable being an investigation of the electrical conductivity of alloys, wherein he was associated with Drs. Matthiessen and Holzmann; the results of the work were embodied in a paper which was read before the Royal Society. Circumstances decided him not to pursue a scientific career, and he joined his brother, who was a partner in the pharmaceutical business of Messrs. Dinneford and Co., and on the death of his brother he became sole proprietor. He first became a member of the council of the Pharmaceutical Society in 1866, and assisted in the drafting of the Pharmacy Act of 1868, by which the sale of poisons was restricted to registered chemists and druggists, and the practice of pharmacy placed on a more or less regular basis. For many years he was a member of the society's board of examiners. From 1882 to 1896 he held the office of president, and his endeavour throughout that period was to place the educational standard of pharmacists on a higher plane, for he realised the force and wisdom of the policy of the founders of the society, namely, that the foundation of effective organisation was education in its widest sense; his efforts were largely devoted to securing for the society a position among the

recognised technical and scientific institutions of the country. With his period of office are associated radical improvements in the society's school, the development of the library and museum, and the foundation of the research laboratory. Notwithstanding the amount of time he devoted to the Pharmaceutical Society, Mr. Carteighe found opportunities for work in other directions; he was one of the founders of the Institute of Chemistry, of which he was for many years a vice-president. He was also a vice-president of the Society of Arts during several years, was one of the most prominent members of the British Pharmaceutical Conference, and was for forty years a member of the Royal Institution. Mr. Carteighe was in his sixty-ninth year.

A DESCRIPTION of the Mitsu-Bishi Dockyard and Engine Works appears in *Engineering* for May 20. These works are among the oldest and largest in Japan, and are situated at Nagasaki and at Kobe. The completeness of the equipment will be understood from the fact that the company is capable of producing, without subcontracting, not only every type of ship, machinery, and boilers for land and marine use, but also of steel girders, steel buildings, electrical machinery, Parsons marine steam turbines and turbo-generators, Stone's manganese-bronze castings, and Morison's "Contraflo" condensers. The company is one of the most important exhibitors at the Japan-British Exhibition at Shepherd's Bush. It is of interest to note that, both in the Nagasaki and Kobe works, the specification and wording in drawings, books, forms, orders, &c., in fact, every writing in the establishment, are in English, besides a greater portion of the correspondence. It is curious to notice a workman carrying out the work to the letter with a drawing worded entirely in English, although he is not able to quote a simple intelligible sentence.

In a paper on steel testing read at the Institution of Mechanical Engineers on Friday, May 27, by Mr. B. Blount, Mr. W. G. Kirkaldy, and Captain H. Riall Sankey, comparisons are made of the tensile, impact-tensile, and repeated bending methods of testing. In the impact-tensile method the specimens were not notched, as is more usual in other impact tests, and were attached to a tup arranged to fall freely through a height of 30 to 40 feet. The tup was of adjustable weight, and was attached to the lower end of the specimen, a cross-head being fixed to its upper end. After falling a measured height the cross-head is arrested by coming into contact with the top faces of a split anvil; the specimen is broken, and the tup continues its fall between the two parts of the anvil. The breaking of electrical contacts during the fall enables the energies at impact and after impact to be deduced, and hence the energy utilised in breaking the specimen. In this method the whole of the material in the cross-section under observation is brought simultaneously under the influence of the impact stress. Three test-pieces of each type of steel were broken by this method, and the readings agree fairly well as regards the energy absorbed by the rupture. The average disparity from the mean is about 6 per cent. The readings of elongation and contraction of area are also in good agreement.

THE old myth of the occurrence of live frogs and toads enclosed in blocks of stone or of coal is not yet dead, but ever and again shows signs of life in the way of vigorous assertion of supposed cases of the phenomenon. We have received a communication from a resident in Leicestershire in which the writer states that, while recently breaking a lump of coal, "from the centre a live half-grown toad fell

out on its back. I called the attention of my neighbours to it, and I thought it was dead; but in a few minutes it began to move about, so I took care of it, and have it now as well as the piece of coal. There is the cavity in the coal where it laid. I can vouch for its genuineness. Is it of any value as a curio to naturalists or geologists? I have had several amateurs to see it." It matters little to tell the reporters of such occurrences that the thing is absolutely impossible, and that our believing it would involve the conclusion that the whole science of geology (not to speak of biology also) is a mass of nonsense. Why that is so it would be difficult to make them understand, for at present, with the exception of the comparatively few professional and amateur geologists, the general public, even some of the most educated, are as ignorant of the most elementary facts of geology as they are of the Chinese language. All popular beliefs, however, rest upon some basis of fact, though the facts may be imperfectly observed and erroneously interpreted. The true interpretation of these alleged occurrences appears to be simply this—a frog or toad is hopping about while a stone is being broken, and the non-scientific observer immediately rushes to the conclusion that he has seen the creature dropping out of the stone itself. One thing is certainly remarkable, that although numbers of field geologists and collectors of specimens of rocks, fossils, and minerals are hammering away all over the world, not one of these investigators has ever come upon a specimen of a live frog or toad imbedded in stone or in coal. Why are these alleged occurrences testified to only by those having no knowledge of geology, and, indeed, for the most part by uneducated workmen? It would indeed be an epoch-making event in the history of science if, for instance, a member of the Geological Survey should lay before us a genuine case of a live frog enclosed in stone!

To the May number of the *Psychological Review* Miss June E. Downey contributes a paper on the determination of sex from handwriting. She concludes from her investigations "that it is possible to determine sex from handwriting in perhaps eighty cases out of a hundred." She finds that "the presence or absence of the so-called sex-signs is . . . influenced largely (1) by the amount of writing done; (2) by age and consequently, to a certain extent, by practice; (3) by professional requirements such as shown by the conventional writing of grade teachers and the rapid hand of bookkeepers." The writing of two hundred persons was examined in this investigation, being submitted to "two professional graphologists and to fifteen persons ignorant of the art of graphology. . . ." A considerable number of the two hundred persons whose writing appears in the series are known to have been educated wholly in co-educational schools in America.

MR. G. W. LAMPLUGH, F.R.S., sends us an interesting article (reprinted from the *Naturalist*) entitled "Man as an Instrument of Research," which formed his recent presidential address to the Hertfordshire Natural History Society. We quote the following paragraphs:—" . . . first, to learn rightly to understand the evidence of the senses; and next, to learn to convey what has been gathered from them in unmistakable terms, are the indispensable qualities in the equipment of man as an instrument of research. . . . Unless . . . we qualify not only as observing, but also as recording instruments, the new knowledge we may have acquired remains merely personal. . . . I suppose that one of the chief difficulties experienced by everyone using language for the description of phenomena is that the observed facts form, as it were, an entangled mass, with innumerable threads, interlacing, converging, diverging

around their common centre in all directions; whereas their expression in language necessitates that the corresponding ideas shall be spun off in linear sequence on a single plane."

In a paper recently read before the Royal Philosophical Society of Glasgow, Prof. G. Elliot Smith discusses the evolution of the practice of mummification in Egypt. It originated from the experience gained of the desiccation of the corpse in hot dry sand. The activity of the grave-plunderer even in pre-dynastic times necessitated adoption of precautions to secure the safety of the remains, and the discovery of the use of copper led to the invention of the coffin, the sarcophagus, and the rock-cut tomb. The abundance of salt and soda, and the use of resin by women for cosmetics, suggested the custom of embalming. The difficulty of accepting this explanation has hitherto lain in the late date assigned to most existing mummies, none of those in the Cairo Museum being older than the last king of the seventeenth dynasty (*circa* B.C. 1580); but much older mummies have recently been traced. One of the time of Snefru was found by Prof. Flinders Petrie near the Medium Pyramid in 1891, and was examined by Prof. Keith (*NATURE*, 1908, p. 342). The date of this specimen has now been fixed by Dr. G. A. Reisner about 2700 B.C. (*NATURE*, March 31, p. 136). It is thus more than eleven centuries older than the other examples, and justifies the belief in the early adoption of the practice of mummification in Egypt.

THE *Zoologist* for May is largely devoted to the habits of animals, Mr. B. F. Cummings contributing the first portion of an article on the formation of useless habits in British newts, as observed in specimens in captivity, and Mr. E. Selous continuing his observations on the nuptial habits of the blackcock.

DR. W. E. HOYLE has sent us a copy of a list of the generic names of the dibranchiate cephalopods, with their typical species, published in vol. xxxii. of the *Abhandlungen der Senckenbergischen Naturforschenden Gesellschaft*, forming the "Festschrift zum Siebenzigsten Geburtstag von Wilhelm Kobelt."

To vol. xxxii., Nos. 2 and 3, of *Notes from the Leyden Museum*, Dr. E. D. Van Oort contributes a long list of birds from western Java and Krakatau, among which a *Gerygone* is described as new. Later on Dr. E. Hartert expresses the opinion that *Passerina*, in place of *Plectrophenax*, should be used as the generic title of the snow-buntings, while Dr. Van Oort maintains precisely the opposite. This scarcely looks like the attainment of that uniformity in nomenclature of which so much is from time to time heard.

ACCORDING to the *Field* of May 21, a correspondent of the *Baltische Waidmannsblad* states that before the Russians came to the province of Ussuri the tiger was literally king of the forest in that district. The natives, Chinese and others, as well as the immigrant Koreans, looked upon the animal as a god. If any of them met a tiger there was no question of resistance or fighting; the man threw himself on his knees and allowed himself to be killed if the animal attacked him. When domestic animals were seized, the owner looked quietly on. Generally it was the Chinese who risked their lives when they went to the forest to collect shed deer antlers or roots of the gusing plant for medicinal purposes. They fell easy victims to the tigers, which at that time frequented the immediate neighbourhood of Vladivostok, where the primeval forest remained dense and almost impenetrable. Gradually the Russians settled in these tracts, and the first thing they

did was to clear away the trees in order to cultivate the land. This checked the tigers, and not only did the white man defend himself with courage when attacked, but became the aggressor. The tigers came to distinguish between Chinese and Coreans on the one hand and white men on the other, and, unless circumstances prevented, avoided the latter.

A USEFUL "Catalogue of Nearctic Spiders," by Mr. Nathan Banks, has lately been issued as Bulletin 72 of the United States National Museum. It includes more than 1300 species, and the author anticipates that at least 2000 will be recognised "when the west and south are explored as thoroughly as New England now is." The arrangement followed is on the whole that of Simon's "Histoire naturelle des Araignées." It is of interest to note that a large proportion of genera and a small proportion of species are common to the European and North American faunas. The inclusion of the southern States in the "Nearctic Region" leads to the appearance of some characteristically tropical spiders, such as the large Theraphosidae, but there is no information as to the distribution of northern species in Canada.

OF the various agricultural students' publications, few are more interesting than the Proceedings of Armstrong College Agricultural Students' Association. The current issue (part ii., vol. ii.) contains a paper by Dr. Stevenson on Aberdeen Angus cattle, their breeding and management, and a very readable essay by Mr. Walling on a typical north Devonshire farm. The association encourages its members by the offer of prizes to prepare papers on agricultural subjects, and to carry out agricultural experiments. The membership during the past year is stated to have been 130.

THE prospects of vanilla-growing in the West Indies are discussed in a recent issue (No. 204) of the *Agricultural News*, the problem having arisen because of the recent rise in price of vanilla. Hitherto there has been some fear, not altogether unfounded, that the synthetically prepared vanillin would drive the natural product out of cultivation, but since the passage of the American pure-food law has necessitated a declaration of the materials used, it has been found that people prefer the natural vanilla, the sale of which is said to have increased in consequence. It appears that the general production and consumption are both increasing, but only in the French colonies is there any immediate likelihood of over-production. The reports from various markets which are summarised in the article seem to be favourable on the whole.

MR. J. W. SMALL has recorded in the *Ceylon Observer* the occurrence of a cocoa-nut palm at Jaffna, Ceylon, with sixteen branches arising near the base of the plant. A similar instance, but with only five branches, is described by Dr. S. Pulney Andy in the Transactions of the Linnean Society, Botany, xxvi., 661. A list of branched specimens of *Cocos* is given by Morris in the Journ. Linn. Soc., xxiv., 1892, 294, in a paper on the occurrence of branching and forking in palms. Ridley, in the *Annals of Botany*, xxi., 45, and xxiii., 338, enumerates nineteen genera of palms in which branching of the stem takes place, and states that this occurs most commonly in *Cocos nucifera*, although the percentage of branched trees is not large. In most cases the branching appears to be due to the development of lateral buds, and the rapidly growing shoots so produced soon equal in size that from which they originated. It has been stated, though not clearly proved,

that the destruction of the terminal bud by insect or other agency may be followed by the production of lateral buds. No instance of branching in monocarpic palms has been recorded.

A PAMPHLET on the origin of typhoons has been prepared by Mr. J. I. Plummer, chief assistant, Hong Kong Observatory. The author points out that although his paper has not received the imprimatur of scientific opinion, it is at least the outcome of twenty years' experience of typhoons, with exceptional means for their examination. Much still requires to be known about the tracks followed by such storms, the cause of their re-curvature, rate of translation, and frequency. They have been under special observation in the vicinities of Mauritius, Bay of Bengal, Eastern Archipelago, south-east of China, and West Indies. Their frequency varies considerably in these localities; in the Bay of Bengal and the West Indies the storms, the author states, appear to be more noted for their severity than for their number, while the northern part of the China Sea appears to be more troubled by them than any other portion of the globe. Among the main conclusions drawn are, (1) that although the open sea is the point where they become appreciable, the earliest beginnings of typhoons must be sought for on land; (2) that one typhoon is never the cause of another; if several proceed from a limited area within a few days, they are caused by separate impulses; (3) that a typhoon, once formed, does not tend to coalesce with another, but rather repels it, with the result that one becomes intensified at the expense of the other.

IN the second number of the Bulletin of the Calcutta Mathematical Society (1909), recently received, Prof. C. E. Cullis continues his discussion of Möbius's cubic surface, the nature of which was explained fully in the first number. In addition to several other original papers, a translation is given of the late Prof. H. Minkowski's address on space and time, and the notes, abstracts, and lists of current literature render this second number as valuable a book of reference to the mathematician as its predecessor.

AN interesting new "record" in connection with the possibilities of microscopic vision is mentioned in the Journal of the Royal Microscopical Society (April) by Mr. Edward M. Nelson. In 1898 Mr. Nelson observed, for the first time, tertiary markings on the diatom *Coscinodiscus asteromphalus* mounted in realgar in a slide of "Nottingham" deposit. Although he has tested hundreds of objectives with a balsam mount of the same diatom, it has been found impossible to resolve the tertiaries in this medium until a month or two ago, when a new Zeiss's long tube  $\frac{1}{2}$  apochromatic of numerical aperture 1.4 rendered them conspicuous. A comparison of this test with the previous ones leads the author to assert that the new lens marks a distinct advance on its predecessors.

UNDER the title "The Most Curious Craft Afloat," Dr. L. A. Bauer gives in the March number of the *National Geographic Magazine* (Washington) an interesting popular account of the work of the non-magnetic yacht *Carnegie*. The article is well illustrated from photographs taken by various expeditions sent out by the Carnegie Institution of Washington, and some of the illustrations enable one to appreciate very thoroughly the difficulties of magnetic survey work in the remote parts of Canada, India, and China.

SEPARATE copies have reached us of several papers which the staff of the Reichsanstalt at Charlottenburg have communicated to the "Annalen der Physik" during the last six



months. Amongst them are two which deal with the saturation pressure of water vapour at temperatures outside the range 50° C. to 200° C., covered by the experiments of Drs. Holborn and Henning in 1908. The first paper, by Drs. Scheel and Heuse, deals with temperatures between 0° C. and 50° C. They use the static method, measuring the temperature by a platinum thermometer and the pressure by the modified mercury manometer we noticed in these columns some time ago. The second paper, by Drs. Holborn and Baumann, deals with the range from 200° C. to 376° C. Temperatures were measured by the platinum thermometer, pressures by a weighted piston moving in a brass cylinder. Except at the highest temperature the three sets of measurements can be represented by formulæ of the type suggested by Thiesen,

$$\text{i.e. } (t + 273) \log \frac{p}{760} = a(t - 100) - b\{(365 - t)^4 - 265^4\},$$

where  $a$  and  $b$  are constants.

MR. W. P. SEXTON informs us that the value of the specific heat of the first four molecules of water of crystallisation in copper sulphate given by him in his note to the Faraday Society, referred to in NATURE of May 5 (p. 292), should have been 0.449, and not 0.499, as stated in our report.

THE issue of *The Central* for April is a memorial number dealing with the life and work of the late Prof. W. E. Ayrton, F.R.S. The number contains two memoirs by Mr. Maurice Solomon and Prof. T. Mather, F.R.S., respectively, and is illustrated by four portraits of Prof. Ayrton at various ages. A list of Prof. Ayrton's scientific publications completes the number.

THE first parts of two new works dealing, respectively, with "Our Canaries" and "Cage-bird Hybrids," have been received from the office of *Cage Birds*. The works will be published in monthly parts, price sixpence each, and will provide keepers of canaries and breeders of canary mules and British bird hybrids with full details relating to the selection, breeding, and general management of these cage birds, either for pleasure or profit. Coloured plates and other illustrations add to the attractiveness of each work.

THE Sleeping Sickness Bureau, under the direction of its honorary managing committee, has issued a revised edition of its brochure entitled "Sleeping Sickness: How to avoid Infection." The pamphlet is for the use of travellers and residents in tropical Africa, and gives an account of *Glossina palpalis* and illustrations of this and other biting flies. Much useful information is provided as to places where persons are liable to be bitten, and the steps to be taken to abolish and to prevent the spread of the fly.

A COPY of the report of the Indian Association for the Cultivation of Science for the year 1908, which was published in Calcutta last year, has just been received. One of the chief activities of the association is the arrangement of lectures on scientific subjects, and we notice that 286 were given under the auspices of the association during 1908. The association also conducts a chemical laboratory, where students are encouraged to follow systematic courses of work, and arranges for regular meteorological observations to be taken at its observatory and for their publication. The finances of the association appear to be in a flourishing condition. In fact, the officers may be congratulated upon the useful work which is being accomplished under their guidance.

NO. 2118, VOL. 83]

## OUR ASTRONOMICAL COLUMN.

THE SOLAR CONSTANT.—In No. 4, vol. xxxix., of the *Memorie della Societa degli Spettroscopisti Italiani* Dr. Gorczynski discusses the pyrheliometric observations of the solar constant made at Ursynova (Polonia) during 1909. The value obtained was 2.05 gr. cal./cm.<sup>2</sup> min., and, from a discussion of the values obtained at various observatories by different methods, Dr. Gorczynski concludes that this value is very near the truth.

ORIGIN OF BINARY STARS.—In No. 3, vol. xxxi., of the *Astrophysical Journal* Prof. H. N. Russell discusses the origin of binary stars from the point of view that they are produced by the fission of rotating masses. He deduces the conditions of such a mass which would precede and follow the process of fission, and also shows that the available data derivable from existing systems are in accordance with the theory. Finally, Dr. Russell concludes that whilst the development of nuclei in the original nebula must be invoked to account for the formation of star clusters, it is more reasonable to suppose that binary systems have been produced by fission.

THE ASTRONOMICAL SOCIETY OF ANTWERP.—The annual report, for 1909, of the Société d'Astronomie d'Anvers contains a record of much, extremely useful, service performed in the popularisation of astronomy. Popular lectures in French and Flemish were given by various members of the society, and were free to all; further, they were well attended. There is a project on foot to obtain facilities from the town authorities for the erection of a larger observatory, and it is expected that the object will be attained during the present year; the society could then do more than ever to spread the study of the heavens.

The interest in, and general ignorance concerning Halley's comet displayed by English crowds during the past few weeks engender the wish that more could be done for popular astronomy in England, and the present moment seems favourable; but it could probably only be done by the private munificence of some friend of science. There can be no two opinions as to the urgent need for popular instruction in the oldest of the sciences.

## OBSERVATIONS OF HALLEY'S COMET.

THERE is little more to record of Halley's comet yet; as a popular spectacle, in England, its appearance has been somewhat of a failure, and we shall have to wait some little time before the results obtained by astronomers in different countries are available. Some amount of resentment has been expressed in the popular Press at the feeble appearance of the famous comet, but it should be clearly understood that it is our hazy summer skies and the brightness of our northern twilight that are to blame. In a letter to Prof. Turner Mr. Knox Shaw, of the Helwan Observatory, describes it as really a glorious sight, about May 11, far exceeding in its glory comet 1910a; it then had a straight tail 38° long. Yet at Helwan there were only three fine nights during the first fortnight in May.

With his note in No. 20 of the *Comptes rendus* (May 17) M. Esclançon gives four diagrams showing the progressive development of the nucleus and its appendages between February 13 and May 11. On the former date the nebulous head was nearly circular, but the ill-defined nucleus had already two embryo extensions, which gave it a triangular appearance. On April 27 the head was parabolic, with the nucleus a little behind the focus, and two jets forming a broad V streaming behind; there was also a bunch of rays issuing in the shape of a fan towards the sun. On May 10 this aigrette was larger and better defined, having an angle of 70° and a length of about 30", but the two rear streamers were not so definite. Up to this time the aigrette had appeared to be symmetrical with regard to the axis of the comet, but on May 11 it was appreciably displaced, the angle between the axes of the aigrette and of the comet being some 20° or 30°. M. Esclançon suggests that this observation might indicate an oscillation of the aigrettes such as was noted during the apparition of 1835. He also remarks upon the great length of tail, which on May 16 was about 65°, corresponding to an actual length of 0.20 astronomical unit.